



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,879	12/16/2003	Seongmoon Wang	02008	5319

7590 03/21/2006

NEC Laboratories America, Inc.
4 Independence Way
Princeton, NJ 08540

EXAMINER

DO, THUAN V

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,879

Applicant(s)

WANG ET AL.

Examiner

Thuan Do

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 38-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/16/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is responsive to application filed on 12/16/2003. Claims 1-38 are pending in this office action. The non selected claims 39-57 are required to cancel in the next response.

RESTRICTION ELECTION

2. A telephone interview with Benjamin Lee was given on 03/17/2006 and Mr. Lee elected group 1, claims 1-37 without traverse.

This application contains claims directed to the following patentably distinct species of the claimed invention:

Group I, independent group claims 1,12,18,28,32 draw to a first standard scan cell; a combinational test point positioned immediately after the first standard scan cell in a scan chain; and a second standard scan cell positioned immediately after the combinational test point in the scan chain.

Group II, independent group claim 39 draw to a) applying a first set of two pattern tests using a skewed-load approach under standard scan environments; b) applying a second set of two pattern tests that target faults that are not detected in step a using a broadside-load approach under standard scan environments; and c) dividing test efforts required for remaining faults into a plurality of sub-phases and under each sub-phase enabling a different set of test points in every activation and propagation test cycle while the test points other than said different set of test points remain disabled.

Group II, independent group claim 48 draw to a) identifying dependency untestable transition delay faults; b) initializing global variables; c) initializing a current test cube pair set and a current test point vector; d) stopping the procedure if no more untested fault exists in a fault list; e) selecting and marking an unmarked fault that has a minimum test generation cost in the fault list; f) generating a test cube pair for the unmarked fault; g) if the test cube pair generated in step f cannot be added to the current test cube pair set due to a conflict with any other test cube pair in the current

test cube pair set, discarding the generated test cube pair and going to step e; h) adding the generated test cube pair into the current test cube pair set and updating the current test point vector accordingly; and i) if no more test cube pair can be added into the test cube pair set without conflict with other test cube pairs in the current test cube pair set, updating a global test point vector and going to step c.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement is traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48 (b) if one

Art Unit: 2825

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

Claim objections

Claim 1, the term “a second standard scan cell positioned immediately after the combinational test point”; and

claim 16, the term “untestable transition delay faults”,
are unclear to what applicants intend to mean. Clarification or correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-37 are rejected under 35 U.S.C. 102(b) as being unpatentable over the prior art of Bhawmik et al., Pat. No. 6148425.

Regarding claim 1: The prior art teaches a logic circuit comprising:
a first standard scan cell (col. 1, lines 43-57);
a combinational test point positioned immediately after the first standard scan cell in a scan chain (col. 1, lines 43-57); and
a second standard scan cell positioned immediately after the combinational test point in the scan chain (col. 5, lines 37-64 and col. 6, line 62 through col. 7, line 7 for determine the test point positions including the second position).

Regarding claim 2: The prior art teaches a logic circuit with standard scan cell (col. 1, lines 43-57).

Regarding claim 3: The prior art teaches a logic circuit with flip-flops (col. 1, lines 43-57).

Regarding claims 4,5,6: The prior art teaches a logic circuit with gates (col. 1, lines 15-28).

Regarding claims 7,8: The prior art teaches a logic circuit with environments (col. 1, lines 43-57).

Regarding claim 16: The prior art teaches a logic circuit with identifying dependency untestable transition delay faults; for every such fault, generating a test cube pair for the fault if the fault has a minimum test generation cost, and if there is no conflict with any other test cube pair in a current test cube pair set, adding the test cube pair into the current test cube pair set and updating a current test point vector based on the current test cube pair set; and generating a global test point vector based on the current test point vector, where the global test point vector specifies the position where the test point should be inserted (col. 5, lines 37-64).

The remaining claims of 102(b) section contain features similar to the rejection of the above claims and rejected in the rationale.

CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan Do whose telephone number is 571-272-1891. The examiner can normally be reached on Monday-Friday 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone numbers for proceeding this application is 571 273-8300.

Art Unit: 2825

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 800-786-9199.

A handwritten signature in black ink, appearing to read "Thuan Do".

Thuan Do
Primary examiner
03/17/2006